The given recursive function `mystery` processes a string `s` in a way that it splits the string into two halves, recursively calls itself on each half, and then concatenates the results in reverse order. Let's analyze how it works step-by-step.

```java
public static String mystery(String s) {
    int n = s.length();
    if (n <= 1) return s;
    String a = s.substring(0, n/2);
    String b = s.substring(n/2, n);
    return mystery(b) + mystery(a);
}
```

Analysis:

1. **Base Case:**

   - If the length of the string `s` is less than or equal to 1, it returns `s` as it is. This means if the string is empty or has only one character, it is returned unchanged.

2. **Recursive Case:**

   - The string `s` is split into two halves: `a` is the first half, and `b` is the second half.
   - It then recursively calls `mystery` on `b` and `a`, and concatenates the results in the order `mystery(b) + mystery(a)`.

Example Walkthrough:

Let's see what happens with an example string `"abcd"`.

1. **First Call:**

   ```
   mystery("abcd");
   ```
   - `n = 4`, so `a = "ab"`, `b = "cd"`
   - Result is `mystery("cd") + mystery("ab")`

2. **Second Call for `mystery("cd")`:**

   ```
   mystery("cd");
   ```
   - `n = 2`, so `a = "c"`, `b = "d"`
   - Result is `mystery("d") + mystery("c")`
   - Both `mystery("d")` and `mystery("c")` hit the base case and return `"d"` and `"c"` respectively
   - So, `mystery("cd")` returns `"dc"`

3. **Second Call for `mystery("ab")`:**

   ```
   mystery("ab");
   ```
   - `n = 2`, so `a = "a"`, `b = "b"`
   - Result is `mystery("b") + mystery("a")`

- Both `mystery("b")` and `mystery("a")` hit the base case and return `"b"` and `"a"` respectively
- So, `mystery("ab")` returns `"ba"`

4. **Combining Results:**

- From the first call, we now have `mystery("cd") = "dc"` and `mystery("ab") = "ba"`
- So, `mystery("abcd")` returns `"dcba"`

Generalization:

The function effectively reverses the order of characters by splitting the string recursively into halves and concatenating them in reverse order.

Conclusion:

The function `mystery` returns the reverse of the input string `s`. So for any input string `s`, `mystery(s)` returns the string in reverse order.